

Listing of Claims:

1. (Currently Amended) An image forming apparatus
comprising:

an image forming unit for forming a correcting image for
correcting gradations of an output image, on a bearing body;

5 a sensor for measuring a reflected light quantity of the
correcting image formed on the bearing body;

a gradation correcting unit for correcting the gradations of
the output image, based on a measurement result of the measured
reflected light quantity of the correcting image; and

10 a timing correcting unit for detecting a shift of
measurement timing at which the correcting image is measured by
the sensor, based on the measurement result by the sensor, and
for correcting the detected shift of the measurement timing;

wherein the gradation correcting unit corrects the
15 gradations of the output image using the measurement result which
is measured at the timing corrected by the timing correcting
unit.

2. (Currently Amended) The image forming apparatus of
claim 1, wherein:

the correcting image comprises a gradation pattern
comprising a plurality of gradations;

5 the sensor measures the reflected light ~~quantities~~ quantity
of the correcting image at a fixed interval timing; and

 the timing correcting unit detects a shift between a
specified timing prescribed in advance as a timing at which a
measurement of a head part of the gradation pattern is started,
10 and a timing at which a measured value having a largest change of
~~the~~ measured light quantity value in a vicinity of the specified
timing is measured, as the shift of the measurement timing, based
on the measured values measured at the fixed interval timing.

3. (Currently Amended) The image forming apparatus of
claim 1, wherein:

 the correcting image comprises a gradation pattern
comprising a plurality of gradations;

5 the sensor measures the reflected light ~~quantities~~ quantity
of the correcting image at a fixed interval timing; and

 the timing correcting unit detects ~~the~~ a shift between a
specified timing prescribed in advance as a timing at which a
measurement of a head part of the gradation pattern is started,
10 and a timing at which a measured value near to an intermediate
light quantity value of ~~the~~ measured values in a vicinity of the
specified timing is measured, as the shift of the measurement
timing, based on the measured values measured at the fixed
interval timing.

4. (Original) The image forming apparatus of claim 1, wherein the timing correcting unit corrects the measurement timing of the sensor by the shift quantity of the detected measurement timing.

5. (Currently Amended) The image forming apparatus of claim 1, wherein:

the timing correcting unit corrects the shift of the measurement timing by selecting the measured value to be applied as an output density value of each gradation in the gradation pattern among the respective measured values measured by the sensor according to the detected shift quantity of the measurement timing; and

the gradation correcting unit performs the gradation correction based on the measured value selected as the output density value of each gradation.

6. (Currently Amended) The image forming apparatus of claim 1, wherein:

the correcting image comprises a gradation pattern comprising a plurality of gradations; and

the timing correcting unit detects the respective shift of the measurement timing from the plurality of gradation patterns,

and performs the correction of the measurement timing by applying the shift quantities of the measurement timing, which are detected in the respective gradation patterns, to each of the gradation patterns.

7. (Currently Amended) The image forming apparatus of claim 1, wherein:

the correcting image comprises a gradation pattern comprising a plurality of gradations; and

the timing correcting unit detects the respective shift of the measurement timing from the plurality of gradation patterns, and corrects the shift of the measurement timing by applying an average value of the shift quantities, which are detected in the respective gradation patterns, to all of the gradation patterns, as a common shift quantity.

8. (Currently Amended) The image forming apparatus of claim 6, wherein the plurality of gradation patterns are ~~all same~~ gradation patterns identical.

9. (Original) The image forming apparatus of claim 6, wherein the plurality of gradation patterns are different from one another.

10. (Original) The image forming apparatus of claim 2, wherein each gradation of the gradation pattern is formed in order that the measurement by the sensor is performed in an order from a high density gradation to a low density gradation.

11. (Currently Amended) The image forming apparatus of claim 1, wherein:

the correcting image comprises a plurality of colors;

the gradation correcting unit performs the gradation
5 correction of each color based on the measured value of the reflected light quantity of the correcting image comprising the plurality of colors; and

the timing correcting unit corrects the shift of the measurement timing at every measurement of the reflected light
10 quantity of the correcting image of each color.

12. (Currently Amended) The image forming apparatus of claim 1, wherein:

the bearing body is a transfer member; and

the sensor measures the reflected light quantity of the correcting image formed on the transfer member.

13. (Currently Amended) An image forming apparatus
comprising:

an image forming unit for forming a correcting image, which
is an image for correcting gradations of an output image and
5 comprises a gradation pattern comprising a plurality of
gradations, on a bearing body;

a sensor for measuring reflected light quantities of the
correcting image formed on the bearing body at a fixed interval
timing;

10 a gradation correcting unit for correcting the gradations of
the output image, based on measurement results of the measured
reflected light quantities of the correcting image; and

a timing correcting unit for detecting a shift between a
specified timing prescribed in advance as a timing at which a
15 measurement of a head part of the gradation pattern is started,
and a timing at which a measured value having a largest change of
~~the~~ measured light quantity value in a vicinity of the specified
timing is measured, as the shift of the measurement timing, based
on the measured values measured at the fixed interval timing, and
20 for correcting the detected shift of the measurement timing;

wherein the gradation correcting unit corrects the
gradations of the output image using the measurement result which
is measured at the timing corrected by the timing correcting
unit.

14. (Currently Amended) An image forming apparatus
comprising:

an image forming unit for forming a correcting image, which
is an image for correcting gradations of an output image and
5 comprises a gradation pattern comprising a plurality of
gradations, on a bearing body;

a sensor for measuring reflected light quantities of the
correcting image formed on the bearing body at fixed interval
timing;

10 a gradation correcting unit for correcting the gradations of
the output image, based on measurement results of the measured
reflected light quantities of the correcting image; and

a timing correcting unit for detecting a shift between a
specified timing prescribed in advance as a timing at which a
15 measurement of a head part of the gradation pattern is started,
and a timing at which a measured value near to an intermediate
light quantity value of ~~the~~ measured values in a vicinity of the
specified timing is measured, as the shift of the measurement
timing, based on the measured values measured at the fixed
20 interval timing, and for correcting the detected shift of the
measurement timing;

wherein the gradation correcting unit corrects the gradations
of the output image using the measurement result which is measured
at the timing corrected by the timing correcting unit.

15. (Currently Amended) An image forming apparatus
comprising:

a bearing body on which an image to be detected is formed;

a sensor for performing a plurality of measurements at a
prescribed interval, to a surface of the bearing body moving
relatively; and

a timing correcting unit for detecting a timing shift
between a specified timing prescribed in advance and a timing at
which a measured value having a largest change in value out of a
plurality of measured values which are sequentially measured by
the sensor is obtained, and for correcting a timing of measuring
the image to be detected based on the detecting timing shift; and

a control unit for determining a measured value which is
measured by the sensor at the corrected timing as a measured
value of the image to be detected.

~~a judging unit for judging which measurement result is a
detection result of the image to be detected, which is formed on
the surface of the bearing body, among the plurality of
measurement results.~~

16. (Currently Amended) The image forming apparatus of
claim 15, wherein the sensor is controlled to perform a plurality
of times of the measurements at a fixed time interval.

Claim 17 (Canceled).

18. (Original) The image forming apparatus of claim 15, wherein the image to be detected is a gradation pattern comprising a plurality of gradation images different from one another.

19. (Currently Amended) The image forming apparatus of claim 18, wherein:

the sensor performs a plurality of times ~~of~~ the measurements of reflected light quantities at the prescribed interval; and

5 the ~~judging unit~~ timing correcting unit detects a shift between the specified timing prescribed in advance as a timing at which a measurement of a head part of the gradation pattern is started, and a timing at which a measured value having a largest change of measured light quantity value in a vicinity of the
10 specified timing is measured, as the shift of the measurement timing, based on the plurality of measurement results by the sensor, and corrects the specified timing so as to remove the shift.

20. (Original) The image forming apparatus of claim 15, wherein the bearing body is any one of a photosensitive body, a transfer member onto which a toner image on the photosensitive

body is transferred, and a recording material on which an image
5 is recorded.

21. (Original) The image forming apparatus of claim 15,
further comprising:

a storage unit for storing the image to be detected;

an image forming main body unit for forming the image to be
5 detected, which is stored in the storage unit, on the bearing
body; and

a gradation correcting unit for correcting gradations of an
output image output from the image forming main body unit, based
on a result of the measurement of the image to be detected by the
10 sensor.

22. (Currently Amended) A gradation correction method
comprising:

forming a correcting image for correcting gradations of an
output image, on a bearing body;

5 measuring a reflected light quantity of the correcting image
formed on the bearing body by the sensor;

detecting a shift of measurement timing at which the
correcting image is measured by the sensor, based on a
measurement result by the sensor, and correcting the detected
10 shift of the measurement timing; and

correcting the gradations of the output image ~~, based on a measured value of the reflected light quantity of the correcting image after the correcting of the measurement timing using the measurement result which is measured at the corrected timing.~~

23. (Currently Amended) The gradation correction method of claim 22, wherein:

the correcting image comprises a gradation pattern comprising a plurality of gradations;

5 the measuring is performed by measuring the reflected light quantities quantity of the correcting image at a fixed interval timing; and

the detecting and the correcting of the shift is performed by detecting ~~the~~ a shift between a specified timing prescribed in advance as a timing at which a measurement of a head part of the gradation pattern is started, and a timing at which ~~the~~ a measured value having a largest change of ~~the~~ measured light quantity value in a vicinity of the specified timing is measured, as the shift of the measurement timing, based on the measured values measured at the fixed interval timing.

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24. (Currently Amended) The gradation correction method of claim 22, wherein:

the correcting image comprises a gradation pattern
comprising a plurality of gradations;

5 the measuring is performed by measuring the reflected light
quantities of the correcting image at a fixed interval timing;
and

the detecting and the correcting of the shift is performed
by detecting ~~the~~ a shift between a specified timing prescribed in
10 advance as a timing at which a measurement of a head part of the
gradation pattern is started, and a timing at which ~~the~~ a
measured value near to an intermediate light quantity value of
~~the~~ measured values in a vicinity of the specified timing is
measured, as the shift of the measurement timing, based on the
15 measured values measured at the fixed interval timing.

25. (Original) The gradation correction method of claim 22,
wherein the detecting and the correcting of the shift is
performed by correcting the measurement timing of the sensor by
the shift quantity of the detected measurement timing.

26. (Currently Amended) The gradation correction method of
claim 22, wherein:

the detecting and the correcting of the shift is performed
by correcting the shift of the measurement timing by selecting
5 the measured value to be applied as an output density value of

each gradation in the gradation pattern among the respective measured values measured by the sensor according to the detected shift quantity of the measurement timing; and

the correcting of the gradations is performed by performing
10 the gradation correction based on the measured value selected as the output density value of each gradation.

27. (Currently Amended) The gradation correction method of claim 22, wherein:

the correcting image comprises a gradation pattern comprising a plurality of gradations; and

5 the detecting and the correcting of the shift is performed by detecting the respective shift of the measurement timing from the plurality of gradation patterns, and by performing the correction of the measurement timing by applying the shift quantities of the measurement timing, which are detected in the
10 respective gradation patterns, to each of the gradation patterns.

28. (Currently Amended) The gradation correction method of claim 22, wherein:

the correcting image comprises a gradation pattern comprising a plurality of gradations; and

5 the detecting and the correcting of the shift is performed by detecting the respective shift of the measurement timing from

the plurality of gradation patterns, and by correcting the ~~sift~~
shift of the measurement timing by applying an average value of
the shift quantities, which are detected in the respective
10 gradation patterns, to all of the gradation patterns, as a common
shift quantity.

29. (Currently Amended) The gradation correction method of
claim 27, wherein the plurality of gradation patterns are ~~all~~
~~same gradation patterns~~ identical.

30. (Original) The gradation correction method of claim 27,
wherein the plurality of gradation patterns are different from
one another.

31. (Original) The gradation correction method of claim 23,
wherein each gradation of the gradation pattern is formed in
order that the measurement by the sensor is performed in an order
from a high density gradation to a low density gradation.

32. (Currently Amended) The gradation correction method of
claim 22, wherein:

the correcting image comprises a plurality of colors;

the detecting and the correcting of the shift is performed
5 by correcting the shift of the measurement timing at every

measurement of the reflected light quantity of the correcting image of each color; and

the correcting of the gradations is performed by performing the gradation correction of each color based on the measured
10 value of the reflected light quantity of the correcting image comprising the plurality of colors.

33. (Currently Amended) The gradation correction method of claim 22, wherein:

the bearing body is a transfer member; and

the measuring is performed by measuring the reflected light
5 quantity of the correcting image formed on the transfer member.

34. (Currently Amended) A gradation correction method comprising:

forming a correcting image, which is an image for correcting gradations of an output image and comprises a gradation pattern
5 comprising a plurality of gradations, on a bearing body;

measuring a reflected light ~~quantities~~ quantity of the correcting image formed on the bearing body, by a sensor at a fixed interval timing;

detecting a shift between a specified timing prescribed in
10 advance as a timing at which a measurement of a head part of the gradation pattern is started, and a timing at which a measured

value having a largest change of ~~the~~ measured light quantity value in a vicinity of the specified timing is measured, as the shift of the measurement timing, based on the measured values of the reflected light quantity measured at the fixed interval timing, and correcting the detected shift of the measurement timing; and

correcting the gradations of the output image, based on the measured value of the reflected light quantity of the correcting image after the correcting of the measurement timing.

35. (Currently Amended) A gradation correction method comprising:

forming a correcting image, which is an image for correcting gradations of an output image, and comprises a gradation pattern comprising a plurality of gradations, on a bearing body;

measuring a reflected light ~~quantities~~ quantity of the correcting image formed on the bearing body by a sensor at a fixed interval timing;

detecting a shift between a specified timing prescribed in advance as a timing at which a measurement of a head part of the gradation pattern is started, and a timing at which a measured value near to an intermediate light quantity value of ~~the~~ measured values in a vicinity of the specified timing is measured, as the shift of the measurement timing, based on the

15 measured values of the reflected light quantity measured at the
fixed interval timing, and correcting the detected shift of the
measurement timing; and

correcting the gradations of the output image, based on the
measured value of the reflected light quantity of the correcting
20 image after the correcting of the measurement timing.

36. (Currently Amended) A control method ~~of~~ for controlling
an image forming apparatus comprising:

forming an image to be detected, on a surface of a bearing
body;

5 performing a plurality of measurements to the surface of the
bearing body moving relatively, by a sensor at a predetermined
interval; and

detecting a timing shift between a specified timing
prescribed in advance and a timing at which a measured value
10 having a largest change in value out of a plurality of measured
values which are sequentially measured by the sensor is obtained;

correcting timing of measuring the image to be detected
based on the detected timing shift; and

determining a measured value which is measured by the sensor
15 at the corrected timing as a measured value of the image to be
detected.

~~judging which measurement result is a detection result of an
image to be detected, which is formed on the surface of the
bearing body, among the plurality of measurement results.~~

Claim 37 (Canceled).

38. (Currently Amended) The control method of claim 36,
wherein:

the image to be detected is a gradation pattern comprising a
plurality of gradation images different from one another; ~~and~~

5 the performing of the plurality of measurements are
performed by measuring reflected light quantities a plurality of
times;

~~the control method further comprising, the detecting is
performed by detecting a shift between the specified timing~~
10 prescribed in advance as a timing at which a measurement of a
head part of the gradation pattern is started, and a timing at
which a measured value having a largest change of ~~a~~ measured
light quantity value in a vicinity of the specified timing is
measured, as the shift of the measurement timing, based on the
15 plurality of measurement results; and

~~the correcting is performed by correcting the specified
timing so as to remove the detected shift.~~

39. (Original) The control method of claim 36, further comprising correcting gradations of an output image based on the measurement result of the image to be detected in the performing of the plurality of measurements.